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CASES ILLUSTRATIVE OF MASTOID INFLAMMATION.\*

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L.—F. E., aged 8 years, was seen on July 3d, 1871, at the request of Dr. E. H. Clarke, who was unable to visit her when first called. The patient, whose mother had died of phthisis, had been considered well, with the exception of slight occasional otorrhœa on each side, till some four weeks before, when she had an attack of intense inflammation of the left ear, followed by high fever, great prostration and violent chills, which had continued daily, with increasing severity, for seventeen days. Intermittent fever had been diagnosticated, and she had been on low diet, pilules and quinine without relief. No attention had been paid to the ear, till a gradually increasing swelling over the mastoid forced that organ on the attention of the parents.

At my visit, she was in bed, so weak that she could not move; extremely emaciated; moaning continually and screaming at the least noise or light; intelligence good; pulse 130, weak; skin hot and dry; tongue coated. Behind the left ear was a large, diffuse abscess; the left meatus was filled with pus. Under ether, and with the assistance of Dr. Mann, who saw her then for the first time, an incision, two inches long, was made over the mastoid, and six ounces of thin and most offensive pus were evacuated. The whole bone was denuded for four inches towards the vertex and one inch behind the mastoid, but was not softened at any spot. A cloth tent was inserted, and stimulants and narcotics ordered. Examination of the ears showed both drum-membranes completely destroyed, but the tympana were free from granulations or cavities, as far as could be ascertained by the probe.

For the next week she improved slowly; the chills recurred but once, although there were several times a day exacerbations of fever; the appetite improved and the pulse came down to 100. A small abscess formed over the left scapula, and was opened. On July 11th, there was a recurrence of chills, not severe, with cough and brownish expectoration, rapid respiration and accelerated

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pulse, apparently relieved the next day by extending the original incision downwards, and evacuating the pus which had formed there. A few days afterwards, great puffiness of the eyelids and a diffuse swelling over back of neck showed themselves; this swelling of the neck gradually extended over the left side, and, after five days, an abscess formed on the side of the neck and broke. This swelling of the neck was followed by extreme distention of all the superficial veins of the face, neck and chest, which still remains, more than two years afterwards. An attack of pneumonia now supervened, but, fortunately, was not severe; and this was followed by a post-pharyngeal abscess, which burst, and by abscesses on the opposite side of the neck, the occiput and temple, and by facial erysipelas. The wound over the mastoid healed, but had to be opened twice, under ether, on account of fresh collections of pus; the bone was not found softened at any time. Notwithstanding all of these complications, the patient gradually improved, and, early in September, I ceased regular attendance. On October 20th, she was brought to my office; she had had, in the mean time, partial hemiplegia on the right side, the opposite side from the ear-disease, together with ptosis of the right eyelid; she was then recovering from both, but there was still very perceptible weakness of the right arm and leg. She was in good health, and more fleshy than ever before. The right side of the face was much fuller than the left, and the superficial veins were very much enlarged; there was a fistula over the mastoid, with some discharge, but no bare bone could be detected. The fistula continued to discharge, and, on January 9th, 1872, the parents consented to an operation, when, with the assistance of Dr. John Homans, the mastoid was exposed by an incision through the fistula, and a small opening found to communicate with the cells; the walls of this opening were carious, and at the depth of  $\frac{1}{2}$  inch, on the inner wall of the cells, bare bone could be felt. The carious walls of the fistulous opening were removed with a gouge, and warm water syringed through the tympanum; the inner wall of the cells was not touched. From this time, everything went smoothly; no bad symptoms followed the operation, and in ten days the wound had entirely healed, and the patient has remained well to the present time, as far as the mastoid is concerned; the tympani remain in the same condition as at the first report, both of the membranes being lost; and the child is subject, when she takes cold, to a slight discharge from the exposed mucous membrane.

II.—*Mastoid Inflammation; Trephining of the Healthy Bone on account of Dangerous Symptoms; Recovery.*—A. A., aged 65, sister of charity, seen in consultation with Dr. Geo. S. Hyde, on the 8th of June, 1872, began to suffer with severe pain in the left ear six weeks previously; one week after the pain began, a free discharge from the meatus showed itself, and continued up to the time I saw her. The severe pain in the ear was but little relieved by the discharge,

and she suffered constantly with pain, referred chiefly to the mastoid, but extending somewhat over the left side of the head; with this, there had been marked constitutional disturbance, high pulse, hot, dry skin, anorexia and, within a fortnight, frequent nausea and occasional vomiting. At no time had there been marked swelling around the ear, or headache, other than nervous, to which she had been subject for years. There were no chills. During the whole disease, the patient had been confined to her bed, and was extremely prostrated.

Examination showed an abundant purulent discharge from the left meatus; the left membrana tympani swollen and inflamed, with a large perforation on the posterior segment, equal to one-fourth of the whole membrane. The tympanic mucous membrane was granular; by Valsalva's inflation, air was readily forced through the perforation. There was no swelling, or even tenderness, around the ear or over the mastoid. The pain, which was described as dull and heavy, with an occasional lancinating shoot, was referred to the mastoid. Hearing was completely lost for both watch and voice. The skin was hot and dry, the tongue coated, the pulse 120, and weak.

The severe pain in the ear and the marked constitutional disturbance pointed to an active inflammation still going on in that organ; the large perforation of the membrana tympani and the previous condition of the Eustachian tube precluded the tympanum proper from being the seat of retained pus, and the mastoid cells were alone left as the seat of the disease. The prostration of the patient demanded immediate relief, and I advised perforation of the mastoid cells.

June 9th.—With the assistance of Drs. John Homans and G. S. Hyde, the patient was etherized, and a perpendicular incision, one and a half inches long, made over the mastoid to the bone. The tissues were of their normal thickness and not oedematous; the bone normal, and without any sinus. After incising the periosteum, it was scraped aside, so as to expose the bone, and a few minute vessels were compressed and a ligature applied to the posterior auricular artery. With a triangular borer, five thirty-seconds of an inch in diameter, I then perforated the bone, on a level with the middle of the meatus, to the depth of one third of an inch, before I felt it enter the cells; on withdrawing it, about two drachms of inoffensive pus were evacuated. With a small-pointed syringe, warm water was forced through the perforation in the bone and returned through the meatus, and this was repeated till the cavity was cleansed. A cloth tent was inserted in the opening, and the wound covered with a wet compress.

Six hours after the operation, the patient was very nervous from the ether, and complained of some pain in the ear, but the pulse had come down from 120 to 108. Ordered chloroform, gtt. xx.

June 10th.—Slept well, without pain; felt much better. Pulse 88. Skin cool and moist. Appetite much improved. Tympanum syringed through wound and meatus. Allowed beef-tea and an egg.

June 11th.—Passed a "delightful" night, free from all pain, except an occasional dart; took no chloroform. Pulse 88. Slight discharge of pus from wound. Tympanum syringed as before.

June 12th.—Yesterday afternoon, sharp pain, as of old, felt in the ear, which continued through the night, requiring chloroform; but it passed off toward morning. Pulse 88.

June 13th.—Passed a good night; no return of the pain. Pulse 88; tongue clean. Appetite good. Directed the tympanum to be syringed with warm water three times a day.

June 15th.—No pain, except for three hours last night. Discharge from both meatus and wound slight. Sat up to-day for the first time for seven weeks. Directed that the ear be syringed twice a day, and a solution of sulphate of zinc (gr. i. to  $\frac{3}{4}$  i.) be instilled at night.

June 18th.—Patient reported that, on the 16th, pain returned in the ear, accompanied by a singing; at the same time, there was severe pain in the frontal region and left eye. These pains continued through the 17th. On examination, the discharge was found to be much increased in quantity. The wound was looking well, but some fibrous tissue was sloughing; tongue clean; pulse 84; abdomen tympanic from flatus; watch not heard on contact. Omitted the instillation of zinc, and ordered poultice to wound and two cathartic pills.

June 19th.—Free from pain; slept well, and this morning bright and cheerful. Pulse 82. To douche the tympanum three times a day with warm salt water. R. Quiniae sulph., gr. i, ter die.

June 20th.—Sat up all day; some pain in the ear and through the back of head and left eye for several hours, not so severe as before. Pulse 72. Appetite and strength improving.

June 23d.—Quinine omitted, on account of headache and ringing in both ears; ligature removed and poultice omitted. Ordered iron.

June 26th.—Discharge from wound and meatus diminishing; scarcely a twinge of pain.

July 7th.—Rode out for the first time. No pain; very little discharge. Membrana tympani less swollen and granulations diminishing.

July 19th.—Occasionally slight pain in ear; no discharge from meatus, and the perforation healing. Wound healed, except a small fistula, which still discharged considerably, and through which bare bone could be felt. W. l. on contact.

From this time, the ear-disease progressed favorably. The membrana tympani healed perfectly, and the discharge from the mastoid opening gradually ceased. The hearing, by the first of August, had improved to W. l.  $\frac{3}{4}$ ". V. l. 10'. During the latter part of August, there were nausea and vomiting several times, with occasional ver-

tigo, pain in the stomach, back and lumbar region, and some swelling of the feet, but the patient had been subject to such attacks for years, and no disease was discovered; an analysis of the urine afforded no explanation. During these attacks of vomiting, there was a discharge of blood, in small amount, from the mastoid sinus.

I did not see the patient again till October 22d, 1873, nearly fourteen months afterwards, when she was complaining of pain in the ear, due to a slight cold, and which soon passed off without treatment. She reported that, during the year, she had had no trouble with the ear, except slight and constant subjective noises. Her health had been about as good as usual; she had occasional sick-headaches as ever, some chronic bronchitis, and, occasionally, a great determination of blood to the head, without known cause. During severe vomiting, she had sometimes slight bleeding from the mastoid opening. Examination showed the membrana tympani without cicatrix, very much thickened, and drawn in and immovable. Over the mastoid, was an opening half an inch deep and one eighth of an inch in diameter, lined with a continuation of the outer skin, which became, in the deeper parts, very delicate, and resembled mucous membrane; no opening existed through this into the mastoid cells. W. l. 4". V. l. 8'.

III.—*Mastoid Inflammation ; Fistulous Opening through the Bone; Wilde's Incision; Rapid Recovery.*—C. G., aged 15, was sent to me on July 24th, 1872, with the history that, two months before, during an influenza, he had had acute inflammation of the ear, with discharge. Since that time, the discharge had continued with a constant but slight pain in the ear, annoying tinnitus, and slight, constant vertigo, till yesterday, when nausea and vomiting followed a marked increase in the vertigo; there had been no headache. When I saw him, the only symptoms complained of were a slight, almost constant pain in the left mastoid, with an occasional slight dart into the ear, a staggering gait, with a marked tendency to fall toward the right side, constant nausea and occasional vomiting. The countenance was anxious; pulse 120, of fair strength; tongue clean. Examination of the ear showed a purulent inflammation of the tympanum and a perforation of the drum-membrane, with large polypoid granulations on its edges; the mastoid not red or swollen to the eye, but to the touch slightly fluctuating and a little tender. Watch not heard on contact. Extreme vertigo, with vomiting, resulted directly from the examination.

Under ether, the tissues over the mastoid were freely incised through the periosteum, and, at the extreme lower part of the bone, a small fistulous opening passed into the mastoid cells; through this, thick grumous pus ran out. A tent was inserted in the wound, and douching of meatus and wound with warm water was advised. The vertigo and vomiting were immediately and entirely relieved; the pulse became normal within twenty-four hours. Four days after the

operation, the patient not having been under observation, the wound was found to have healed, and the pain in the mastoid was slightly increased. On this account, the tissues were again incised, under ether, and the bone, which had softened around the previous fistula, was cut through with a knife, opening the cells for a distance of a quarter of an inch; the tympanum was then syringed through the fistula. Examination of the ear, at this time, showed that the inflammation of the drum-membrane was much less, and the polypoid granulations had disappeared. W. I. 4".

From this time, the recovery was rapid; two days after, the discharge, both from the wound and meatus, had ceased, and the perforation of the membrane was found to have healed. W. I. 3".

Six days after, all pain and subjective noises had ceased, and the hearing was rapidly improving. W. I. 20".

I have selected these three cases as illustrative of the more serious forms of mastoid disease; they show the course which the disease may take and the way nature seeks to relieve herself, and thus point out the line of treatment.

Mastoid inflammation, although never primary, is now very properly described as a distinct disease, as it is always serious, and not uncommonly fatal, from involving the brain. The mastoid cells are but a part of the tympanic cavity, lined, like the rest of the cavity, by a delicate mucous membrane, which is in such close connection with the periosteum that the two cannot be separated or even distinguished. An inflammation of the tympanum proper usually implies, also, an inflammation of the mastoid cells of a greater or less intensity, and if this inflammation is so severe as to cause an abundant secretion of pus, an outlet for the matter from the cells can only occur by its breaking through the bone, either externally or internally, while the matter in the tympanum proper only requires to break through the delicate drum-membrane. In the majority of cases, the inflammation subsides and the pus is absorbed, but in some cases the inflammation is too intense for this to occur without the evacuation of the pus, and then nature attempts to form an outlet, as is seen in the first and third cases.

An examination of macerated bones shows, on the outer surface of the mastoid, numerous openings which serve for the passage of blood-vessels into the bone, and some of these undoubtedly are in communication with the circulation of the mucous membrane. Along these vessels the inflammation is transmitted from within to the external periosteum, and, as pus is only formed in the later stages of an inflammation, the first pus formed here will be next the bone where the inflammation is oldest. The pus having formed on the external surface of the bone, it meets with very firm obstacles to reaching the skin, for the whole mastoid serves for the attachment of the sternomastoid tendon, and the pus must work its way through this very

firm fibrous tissue before coming to the subcutaneous tissue. This accounts for the very extensive burrowing of pus in the first case, for three weeks, without its having formed an outlet.

In examining a large number of temporal bones, it will be seen that the thickness and consistency of the mastoid varies very much, and also that, in some, the openings on the external surface are much larger and more numerous than in others. In some bones, it is impossible to see any of these foramina. Thus another obstacle exists here to the exit of the pus, for while, in the cases just spoken of, the bone becomes inflamed, softened and disintegrated around the opening through which the inflamed vessel or vessels pass, in the latter cases a new opening must be formed, a longer time is required, and the patient consequently longer exposed to the risks of retained pus. In the second case reported, it is probable that the unusual thickness of the bone (one-third of an inch) and the absence or very small size of these foramina, prevented any external inflammation; and it is also probable that this is the explanation of those cases in which, after death, the inner wall of the cells next the brain is found carious, while the external wall is healthy. This second case is also peculiar, from the fact that there was no tenderness on pressure of the bone, which I can only explain by supposing that the bone was so very solid that it had not become inflamed. The operation of trephining under these circumstances is, I believe, new; but the condition of the patient was so critical that I had no hesitation in advising it. In the first case, I have no doubt that weeks of suffering and danger would have been avoided if consent could have been obtained to a similar operation.

In the treatment of recent mastoid inflammation, we can generally hope for the subsidence of the disease by the local abstraction of blood and by appropriate treatment to the original cause of the trouble, the inflammation of the tympanum proper. Two to four leeches over the mastoid will often so reduce the congestion that the disease subsides, and warm fomentations to the bone will help the resolution. At the same time, if the tympanum contains pus, this should be evacuated. As a rule, the drum membrane will rupture of itself in a short time; but if such a rupture does not take place, the membrane should be incised to give an exit to the pus, and the drum-membrane and tympanum treated by douching with warm water and by the use of the air-douche, to keep the tympanum free from the irritating matter.

If, however, an external periostitis has been set up, a free incision should be made down to the bone, for, if pus has already formed, it should be evacuated as soon as possible to prevent unnecessary injury to the bone; and, if no pus has formed, the relaxation of the swollen tissues and the bleeding from the incision both relieve the pain and assist in causing the inflammation within the cells to subside. At the time of the incision, the bone should be examined to

see if any fistula exists in it, and if such is found it should be exposed and thoroughly syringed out. The place at which this fistula commonly forms is of considerable importance in aiding us in our search and also in deciding where the bone ought to be trephined, in case such an operation becomes necessary. In all of the cases which I have seen, this fistula has been nearly in the middle of the mastoid, never at the extreme tip nor at the extreme upper part, although in both of these places the bone is very thin.

While the fistula is being sought, the bone should be tested, and it will frequently be found to be so softened that a probe, director, or even a knife can be thrust through into the cells, thus evacuating the pus. If the bone around the fistula is softened, the opening should be enlarged till healthy bone is reached. The first case is interesting as showing how necessary the removal of the softened bone is for a cure, for here the disintegrated bone, although so fine as to escape observation with a probe, kept the wound open for several months, while the removal of the affected bone with a gouge resulted in a cure within ten days. The second case shows how long the mastoid cells may be intensely inflamed without affecting the bone, and in these cases the operation of trephining is especially indicated, as the pus, if meeting with unusual obstacles to its escape externally, is more apt to affect the other walls of the cells and cause fatal disease of the brain.

The great object of treatment in mastoid inflammation is, then, the fulfilment of the well recognized law of surgery to give free exit to the pus.

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In a clinical lecture on Jaundice, Prof. Loomis mentions the following points (*N. Y. Medical Record*, Nov. 15, 1873):—

To determine the situation of the bile-ducts, draw a line from the right nipple to the umbilicus, and the point where this line crosses the free border of the ribs will indicate it very nearly.

Acute jaundice may arise from any cause producing obstruction of the bile-ducts.

Among these is an acute catarrhal inflammation of the ducts. This acute inflammation of the mucous membrane of the bile-ducts is not primary, but is usually propagated from an inflammation in the duodenum. Inflammation of the duodenum is almost always associated with gastric catarrh as the primary disease.

Acute jaundice may also arise from abscess of the liver. The first question one would ask, if suspicion turned in the direction of abscess, would be, has the patient ever had dysentery? Dysentery is the most common cause of hepatic abscess, or, rather, abscess of the liver most frequently occurs with dysentery. It is believed by some that it produces abscess of the liver by embolism, but Prof. Loomis is quite sure that in the majority of cases the embolus cannot be found post mortem; hence he doubts the correctness of the statement that the abscess arises from embolism.

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## Progress in Medicine.

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### REPORT ON PHYSIOLOGY.

By H. P. BOWDITCH, M.D.

(Concluded from page 64.)

#### BILE.

VON WITTICH (*Pflüger's Archiv*, vi. p. 181) made observations on the human bile obtained from a patient with a biliary fistula, caused by the impaction of gall stones in the cystic duct. For some time after the opening of the fistula, the whole of the bile was discharged through it, none entering the intestines, as was evident from the appearance of the faeces. The total quantity discharged daily was 532 cc., an amount considerably below Bidder and Schmidt's estimate (1800 grammes), derived from experiments on dogs, but falling within the limits assigned by Ludwig for the daily secretion of the human bile (160 to 1200 grammes).

Von Wittich also examined the bile thus obtained with regard to its power of converting starch into sugar, and found that it possessed this power in a high degree. In consideration, however, of the wide distribution of sugar-ferments through the body, it seems quite possible that the bile may have acquired this property from some of the tissues with which it came in contact in its passage through the open wound.

The method of experimenting recommended by the author is similar to that proposed by Grünhagen to demonstrate the effect of pepsin. On a coarse filter, kept by a water-bath at a temperature of 40° to 50° C., a stiff starch paste was placed. The addition of a few drops of a solution of the sugar ferment obtained from the bile soon caused a fluid to pass through the filter, and, in this fluid, sugar could be readily detected.

Röhrlig has made some experiments (*Stricker's Jahrbücher*, 1873, p. 240) on the mechanism of the secretion of bile, the subjects of the observations being dogs and rabbits, curarized and kept alive by artificial respiration. A canula was placed in the hepatic duct, the cystic duct was tied, and the rate of the secretion was determined by counting the drops as they fell from the canula. The following are the most important results :—

I. Compression of the portal vein and the hepatic artery at the same time stops the secretion at once. A compression lasting more than one minute produces fatal results.

II. Compression of the portal vein alone diminishes the secretion greatly, but does not stop it.

III. Compression of the hepatic artery alone diminishes the secretion slightly.

IV. Ligature of the aorta, below the diaphragm, diminishes and finally stops the secretion.

V. Ligature of the aorta, below the celiac axis, increases the secretion.

VI. Ligature of the inferior vena cava, above the hepatic vein, diminishes and finally stops the secretion. This shows that the secre-

tion does not depend exclusively on the height of the blood-pressure in the capillaries of the liver, for ligatures applied as in V. and VI. must, in both cases, increase this pressure, while the secretion is in one case increased and in the other diminished.

VII. Chemical, mechanical and electrical irritation of the mucous membrane in all parts of the alimentary canal, and of the liver itself, has no effect on the secretion of the bile.

VIII. Injection into the stomach of products of digestion, taken from the alimentary canal of another animal, increases the secretion.

IX. Diarrhoea is often accompanied by a very rapid secretion.

X. Cathartics, viz. croton oil, colocynth, jalap, aloes, rhubarb, senna, Epsom salts, calomel and castor-oil, injected into the small intestine, cause an increased secretion of bile, which is apparent before the purgative action begins. (This result is diametrically opposed to that obtained by the Edinburgh committee of the British Medical Association, appointed to investigate the action of mercury and other drugs on the biliary secretion. These observers found that purgation, however produced, invariably diminished the quantity of the biliary secretion.) Senna and rhubarb, when injected into the mesenteric veins, increase the secretion of bile, which seems to show that these two drugs act as chologogues independently of their cathartic power. That cathartics, however, may act indirectly as chologogues, in consequence of their increasing the vascularity of the intestines, seems evident from the following results of experiments on the nervous system:—

XI. Section of the splanchnic nerves causes a temporary increase of secretion.

XII. Section of the cervical cord causes increased secretion (but not if a cathartic has been previously given).

XIII. Irritation of sensitive nerves diminishes the secretion.

XIV. Suspension of respiration causes at first a diminished secretion, corresponding to a rise of blood tension, then an increased secretion, corresponding to a fall of blood tension, and, finally, a second diminution of the secretion, due, apparently, to the altered quality of the blood.

XV. Strychnia causes at first a slow and afterwards a rapid secretion, corresponding to a rise and subsequent fall of blood tension.

In the above observations (XI.—XV.), it will be noticed that all those operations which are known to cause contraction of the intestinal vessels (indicated by a rise of blood tension) diminish the secretion of bile, while those which dilate the same vessels have the opposite effect. It is therefore probable that the chologogue action of cathartics may be partly dependent upon the changes produced in the intestinal circulation.

The author confirms the observation of Schmulewitsch (*Ludwig's Arbeiten*, 1868, p. 113) that an excised liver, through the vessels of which defibrinated blood is conducted, continues to secrete bile for some time after its removal from the body. If a one per cent. solution of common salt is used instead of defibrinated blood, no secretion takes place, showing that the fluid in question cannot be simply bile retained in the gall-ducts and pressed out mechanically by the injection into the bloodvessels. The latter view is, however, maintained by Pflüger,\* who supports it by experiments similar to those of

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\* Pflüger's Archiv, iv. p. 54.

Röhrig, except that he used a three per cent. instead of a one per cent. solution of salt. How these results are to be reconciled is not clear.

Munk's experiments (*Pflüger's Archiv*, viii. p. 150) were performed on curarized rabbits, in the same way as Röhrig's. He finds that irritation of the spinal cord (either direct or indirect through sensitive nerves) causes, at first, an increased and afterwards a diminished secretion of bile, instead of simply a diminution, as observed by Röhrig. (See above, XIII.) He thus confirms former observations of Heidenhain, who attributed the primary increase of secretion to the contraction of the muscular walls of the gall-ducts pressing out the bile contained there, and the secondary diminution of secretion to the diminished flow of blood through the capillaries of the liver. Munk demonstrates that the splanchnic nerves are the channel through which both of these effects are produced, for irritation of these nerves causes both the primary increase and the secondary diminution of secretion, and, after section of these nerves, both direct and reflex irritation of the cord remain without effect.

#### BLOOD GLOBULES.

MALASSEZ. *De la Numeration des Globules rouges du Sang.* Paris: 1873.

MANASSEIN. *Ueber die Dimensionen der rothen Blutkörperchen unter verschiedenen Einflüssen.* Berlin: 1872.

Malassez has invented a method by means of which the number of red globules in any specimen of blood may be very rapidly (in 10') determined. The error of the method does not exceed 2 to 3 per cent. The blood to be examined is first diluted by adding 1 part of blood to 99 parts of a solution made by mixing 1 volume of a solution of gum arabic, having a specific gravity of 1020, with 3 volumes of a solution containing equal amounts of sodic sulphate and sodic chloride, and having, also, a specific gravity of 1020. Thus diluted, the blood is introduced into an "artificial capillary," made from a thermometer tube having an elliptical bore, by grinding away the sides parallel to the long axis of the bore, thus reducing the tube to a strip of glass with a flattened canal running through it. The capacity of this capillary tube is determined by calibration with mercury, i. e., by ascertaining the weight of a quantity of mercury which occupies a given length of the tube. This artificial capillary, filled with diluted blood, is examined under the microscope, and the number of globules present in a given length of the tube determined by counting. This process is facilitated by the use of an eye-piece, containing a glass plate with squares ruled on it, which, by means of the draw tube, can be so adjusted that each square shall correspond to a given fraction of a millimetre on the capillary. Knowing, then, the capacity of the capillary, and the amount of dilution of the blood, it is easy to calculate the number of globules in a cubic millimetre of the blood in question.

When the blood of different animals is examined by this method, it is found that, in general, the higher the position in the animal series, the more numerous are the blood globules. As the size of the globules follows approximately an inverse law, it may be said in a general way that the number of globules in the blood of a given animal is inversely proportional to their size. This relation, however, is by no means constant. For example, the globules of man are at the same time less numerous and smaller than those of the dromedary and lama; and birds,

though having larger and less numerous globules than mammals, gain more by the increased volume than they lose by the diminished number. The absolute number of globules is found to vary in mammals between 3,500,000 and 18,000,000 per cubic millimetre of blood. The blood of man has, on an average, about four million.

Malassez has also studied the "globular richness" of the blood in different parts of the circulatory system, and has pointed out the bearing of his results on the solution of various physiological questions. In the first place, he points out that an increased or diminished "globular richness" may be either real or apparent; *real*, when due to a formation or destruction of globules; *apparent*, when due to a diminution or increase in the amount of plasma. Arterial blood is nearly the same all over the body. Venous blood is, in general, richer in globules than arterial blood, but it differs greatly in different parts of the body. This greater globular richness is apparent rather than real, and is due to the diminution of the plasma from evaporation through the skin, from absorption by the lymphatics, and from its going to form part of various secretions. If the amount of blood flowing through an organ is increased, the venous blood becomes, in globular richness, more like the arterial, for less plasma exudes from the vessels in proportion to the amount of blood flowing through them, though the absolute amount thus exuding may be greater. For example, in the case of the submaxillary gland, irritation of the chorda tympani causes an increased flow of blood through the gland, an increased secretion of saliva, and a diminished globular richness of the venous blood. In other words, the venous blood becomes poorer in globules, i. e., richer in plasma, at the same time that the amount of fluid exuding from it is increased. This indicates, of course, that, under the influence of the irritation of the chorda tympani, the amount of blood flowing through the gland increases in a more rapid ratio than the amount of saliva secreted. The blood of the renal vein is 1.03 times richer in globules than that of the renal artery—a small difference, in view of the large amount of fluid excreted by the kidneys, but explicable when we consider the large size of the renal vessels and the immense amount of blood passing through them (938 kilo in twenty-four hours, according to Brown-Séquard).

During digestion, the blood of the mesenteric veins is poorer, but at other times richer in globules than that of the mesenteric arteries. This is, of course, accounted for by the amount of fluid absorbed from the intestine during digestion.

The blood of the splenic vein is from 1.11 to 1.21 times richer in globules than that of the splenic artery. This difference is greater than that which occurs in any of the other abdominal organs. It is probable, therefore, that the diminution of plasma is not the only cause of the difference, but that a real formation of globules takes place in the spleen. This view is strengthened by the fact that the blood of the splenic veins is found to be richest in globules during digestion, which is also the period of the greatest vascularity of the spleen, and this increased vascularity should, if the spleen were like other organs, diminish the venous globular richness.

The hepatic vein shows a diminished globular richness, which cannot be accounted for by any increase of the fluid constituents of the blood, and which indicates, therefore, a destruction of globules in the

liver. This is in accordance with the known solvent action of the biliary salts on the blood globules and with the supposed formation of the coloring matter of the bile from haemoglobin, which implies a destruction of globules.

It should be mentioned that these results, as far as regards the splenic and hepatic veins, are not altogether in accordance with previous observations of a similar nature,\* but, from the great delicacy of the method, and the care with which the experiments have been made, the author's conclusions seem to be entitled to great confidence.

The method of Malassez is likely to be of great use in pathological investigations. The author has already applied it to the study of erysipelas. He finds that, in the blood of the erysipelatous parts, the red globules are increased, and the white globules diminished in number. He finds, also, in the cellular tissue, quite a large quantity of serous fluid, containing a considerable number of white globules. He concludes, therefore, that the blood is only *apparently* richer in red globules, in consequence of fluids and white globules having passed through the vascular walls to accumulate in the cellular tissue.

Manassein has made numerous measurements of blood-globules in various animals and under various influences. He concludes that an increased temperature of the body causes a diminution in the size of the red globules, while a lowered animal temperature has the opposite effect. Hence, in fever, the globules are found to be diminished in size, while all the influences which tend to lower the animal heat (external application of cold, ingestion of alcohol, quinine or prussic acid) increase the size of the globules. The absorption of oxygen causes an increase in the size of the globules, while carbonic acid has the opposite effect.

#### SPONTANEOUS GENERATION.

During the last few years, the old question of the origin of living organisms from non-living matter has been, under the names of archebiosis (Bastian) and abiogenesis (Huxley), brought forward and discussed with renewed energy. The great scientific importance of the problem seems to demand some reference to it in these pages, but, as the question can be regarded as physiological only in the widest sense of the word, its discussion, in this report, may perhaps be considered out of place. The reader is therefore referred to the scientific article of the *Atlantic Monthly* for December, 1873, for an excellent statement of the present condition of the controversy.

In connection with this report, it may be well to mention that the publication of the valuable "Annual Report of Henle and Meissner on the Progress of Anatomy and Physiology," which ceased with the year 1871, has been resumed, under the charge of Professors Hofmann and Schwalbe, assisted by numerous able investigators in various parts of Germany. The first volume of the new series has recently appeared, giving a *résumé* of the work done in 1872. It is in somewhat larger form than the volumes of the old series, and gives evidence that the report will be in the future even more valuable than in the past, as a work of reference for students of physiology.

\* See Carpenter, *Human Physiology*, 7th Ed., p. 227.

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### Bibliographical Notices.

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*On the Origin and Metamorphoses of Insects.* By SIR JOHN LUBBOCK. Nature Series. London : Macmillan & Co.

THE eleven thousand and more pages annually devoted to Entomology but seldom contain much of interest to those who are not themselves devoted to that study, and it is, therefore, peculiarly pleasant to meet this little volume—whose contents are already familiar to many readers of "*Nature*"—attempting, in a popular way, an explanation of the origin of insects. There is, probably, no group in the animal kingdom more puzzling to the evolutionist than the *Insecta*, and few are better fitted to speculate on its origin than Sir John Lubbock, prepared, as he is, by numerous researches on the anatomy and development of the arthropods. In the presentation of his views, however, here, as in his former works, a want of system, and even of clearness, in some cases, is observable, which often obscures or weakens his arguments.

The first chapter, by way of introduction, contains a brief description of the thirteen groups into which Westwood has distributed insects. The influence of external conditions on the form and structure of larvae is next illustrated by such examples as the true caterpillars and the leaf-feeding *Hymenoptera*; the parasitic larvae of *Hymenoptera* and *Diptera*; the wood-boring larvae of different orders, &c. The peculiar case of the beetle *Sitaris*, parasitic on wild bees, whose larva emerges from the egg, an active carnivorous little hexapod, then becomes an apodal honey-eating grub, and, finally, a perfect beetle, is, of course, discussed at length. As the result of these considerations, Lubbock concludes that whenever the larva departs from the hexapod, *Campodea*-like type, it has been modified by the conditions under which it lives, and that, hence, metamorphoses are of two kinds—developmental and adaptive. A chapter on the nature of metamorphoses follows, and examples are given from the Acalephs, Echinoderms and Crustacea, besides insects; a chapter which, perhaps, might better have been omitted, for the light thrown upon the subject is dim, at best, while mere illustration was not wanting.

The main interest of the book is, of course, centered in its concluding chapters on the origin of metamorphoses and the origin of insects, and for both problems Lubbock finds a key in the study of *Campodea*, a genus allied to, and intermediate between, the Lepismas and Poduras. The *Campodeæ* have a mouth, in which the parts are soft, and neither distinctly suctorial nor mandibulate, and we can easily conceive that variations in either direction from this neutral condition were seized on by natural selection, until, in time, a structure exclusively fitted for sucking or biting was produced. And, again, we can fancy some of these ancient *Campodea*-like forms living under conditions rendering a capacity for biting valuable at one time of life, and a capacity for sucking valuable at another period, and, therefore, natural selection would act in opposite directions at different periods in the life of the same individual, and would, in time, produce an insect with a mandibulate larva and a haustellate imago, as in the *Lepidoptera*. Now we know that a change of skin, among the

Articulates, involves a period of quiescence more or less prolonged; and, in the last case, the change of one type of mouth and digestive organs to another, taking place necessarily at the time of shedding the skin, would produce a long period of inactivity, corresponding to the radical change undergone, and, hence, an immobile pupal stage would arise. That these suggestions are ingenious and plausible, will be admitted by the evolutionist; that they fully answer the whole intricate problem of insect origin, is not, of course, to be expected; but if the attention of zoologists is called to this subject, we shall have much to thank Sir John Lubbock for.

As for the *Campodeæ*, Lubbock suggests that their ancestors are to be sought among the Rotifers resembling *Lindia*, a form in which the characteristic "wheels" of the group are wanting; and these, in turn, from the *Infusoria*.

In concluding, we commend this book to the attention of our readers, for, in spite of the faults, before alluded to, it is, certainly, suggestive and instructive. Its numerous outline illustrations, although simple, are, on the whole, very satisfactory, and, with the non-theoretical portion of the reading matter, will render the work of value as an entomological text-book.

E. B.

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**Boston Medical and Surgical Journal.**BOSTON: THURSDAY, JANUARY 22, 1874.

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THE recent protracted hearing before the State Board of Health on the charges against the hog-killing and packing establishment of J. P. Squire, at East Cambridge, although it may have wearied the patience of newspaper readers, has not lost its interest for the medical profession. In the vastness of the pecuniary interests involved, it bids fair to take a place among the *causes célèbres*; while its protracted length brings to mind such trials as those of Warren Hastings and the "Claimant."

At the very outset, the public could not but have been impressed by the strong array of legal and scientific talent summoned on the part of the defence, as contrasted with the modest pretensions of the complainants; reminding one, forcibly, of the Scriptural defiance by the gigantic Philistine of the stripling shepherd boy. As the case went on, the medical mind could not but be struck with the fact—however much the public at large may have failed to see it—that the trial gradually assumed the character of a judicial investigation, such as is properly conducted before a court of law, rather than a Board of Health. The vast pecuniary interests at stake were spread before the public from day to day by a willing press, and the most recondite and elaborate chemical investigations were adduced to confound the natural senses of man. A most persevering effort was also made to prove that the nauseous odors complained of came from some other source than that to which they had been traced—such as Miller's and Charles River flats, &c. As if, before such a tribunal, questions of money interest, or nice chemical analysis, could, by any possibility, be allowed to take precedence of the question of public health and comfort, or the positive evidence of sight, hearing and smell; and as if any amount of ingenious reasoning could make it appear that the killing of a million hogs a year, with the concomitant boiling and rendering, does not constitute a very obvious nuisance of the most abominable character, in the midst of such a crowded population as that of East Cambridge and Somerville.

In the case under consideration, the Board of Health are acting under a responsibility hardly ever equalled in the experience of such bodies. Fortunately, it is so admirably constituted, and its authority has been so judiciously used, that the public has given it a constantly increasing confidence and support. Moreover, it has unlimited power of action. By its decision, it can, at once, shut up any obnoxious

slaughtering and rendering establishment anywhere in the State ; and its repeated action within the past two years has shown that it has the moral courage to act without flinching when the public good demands it.

It must not be lost sight of that a nuisance need not, necessarily, be a direct and immediate cause of death or flagrant sickness, to be intolerable and destructive of all comfort within the range of its influence. Without dwelling upon the great increase of infantile disease in the vicinity of the East Cambridge establishments during the summer season (as proved by competent medical witnesses), the suffering and annoyance caused to thousands of people within a radius of two miles by the nauseous odors given out by them at night during the hottest season of the year, constitute a grievance of the most serious character, and, without doubt, indirectly productive of much positive sickness. It is a fact not generally known, probably, that the most active operations at these great slaughter houses are carried on during the summer months, so that the tolerance of similar establishments at the West by populous neighborhoods cannot be adduced in their defense ; for there the custom is the reverse, the winter being the season of principal activity. Furthermore, certain of the most obnoxious processes are carried on in this vicinity in the night, particularly after midnight, compelling the closing of thousands of windows, no matter what the temperature may be, to exclude the sleep-destroying stench. Then, again, the residents about the scene of slaughter are tormented all through the summer nights by the yells of the hogs in the sticking-pen. The unfortunate porker, no matter what may be his ponderosity, is swung up in the air by a rope around a single hind leg, so as to present his throat to the fatal knife in the speediest and least laborious manner. The hideous outcry goes on without a moment's cessation, and can be heard, we are credibly informed, a quarter of a mile from the scene of slaughter. If sleep by night is needed to repair the waste of the day, it is hardly possible to conceive of a combination of annoyances better calculated to banish it from the pillows of the unhappy people exposed to them.

The Board of Health has not yet published its decision in this important investigation. We wait for the verdict, fully assured that the clear sight of that impartial body will not be blinded by the dust of commercial interest, however golden, nor be-fogged by the mist of chemical special pleading, however ingenious ; nor that other special sense, most immediately concerned in this investigation, be diverted from the track by the numerous side odors and stenches with which it has been attempted to obstruct the direct pursuit of the great cause of offence to its source. We cannot but believe that the decision will bring great relief to suffering thousands.

ACTION AT LAW FOR A DEATH FROM CHLOROFORM.—A Madame Caron, some months since, was taken by her husband to a dentist at Lille to have a tooth drawn. Chloroform was administered in his presence, and his unfortunate wife died. The dentist was condemned, by the Criminal Tribunal at Lille, to a month's imprisonment and 500 francs fine for "homicide by imprudence."

On appeal, the imprisonment was struck out of the sentence. Thereupon, the husband, although he had completely authorized the use of the chloroform, brought a civil action for damages, demanding 20,000 francs in his own interest and that of his son, a minor. The tribunal, considering the fact of homicide by imprudence having been established by the judgment of the criminal court, condemned the defendant to pay 4000 francs damages, 1000 to go to the husband, and 3000 to be put out at interest for the son until he attained his majority.—*Union Médicale*, Dec. 11.

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PHYSIOLOGY OF SLEEP.—The following is an abstract of a paper read in September last, by Dr. Hurd, of Newburyport, before the New Hampshire Medical Society:—

We come now to a subject of the greatest interest, inasmuch as the view entertained is quite a modern one, but which is established by inductive evidence on a firm basis of fact. I allude to the proximate cause of sleep. And, first of all, it would be a legitimate deduction from what has gone before, that the sleeping state would be one of less activity, and, therefore, of less vascularity than the waking one. Less of arterial blood and less oxygen enters the cerebral substance. Were it not possible for tired nature somehow to *put on the brakes*, the persistent in-rushing torrent of oxygenized blood would soon effect the disintegration of all the unstable nerve substance. Stop the arterial stream, and you stop thought. Stop it in part, and you may stop thought, but you do not stop nutrition. How is this process effected? There are, I opine, several factors in the change. First of all, the tired brain sends diminished energy to the heart and lungs, and there is a slowing of the circulation. Secondly, there is a diminished amount of cerebral energy directed to the spinal centres and the sympathetic ganglia, and, in consequence of this inhibitory influence of the brain being withdrawn, the functions of these lower centres are exalted. Now the ganglia of the sympathetic preside over nutrition and those vascular processes on which nutritive operations depend. Its vaso-motor nerves control the arterial system. In active hyperæmia—instance blushing—those nerves are inhibited by a predominating nervous influence, hence the arteries are full, the capillaries and veins engorged. On the other hand, when the sympathetic is irritated, arteries supplied by it are constricted and the territorial region of those arteries becomes anaemic. . . . . What then occasions this liberation of molecular motion by the sympathetic ganglia, causing the circular muscular arterial fibres to contract, and thus narrowing the calibre of the vessels? It is possible that it may be partly due to that spontaneous energy of the motor centres, which no one seems so well to have demonstrated as Prof. Bain, in his systematic works. If the initiative to action be considered as existing in the vaso-motor filaments, what is the stimulus to action? I was for some time in-

clined to think that such stimulus was carbonic acid, as it has been proved that this gas accumulates in the blood during the waking hours. On more mature deliberation, I am convinced that carbonic acid has no such special irritant effect on the sympathetic filaments. The experiments of Liston have proved that it has a positively sedative effect on the elements of the nervous tissues. It interrupts cerebral activity by arresting the chemical interchange between oxygen and the tissues, and so preventing transformation. In the state of normal wakeful activity there is a strong attraction between the elements of the cerebral cells and the oxygen of arterial blood, and the pabulum of the incoming arterial current. This attraction, or "suction" (Virchow), is sufficient to overcome the sympathetic, and distend the bloodvessels. By arresting this molecular metamorphosis, you produce insensibility, a lowering of vital activity, depression, paralysis. If *complete*, cerebrum and medulla are alike incapacitated; general vascular stasis results—the nerve centres are full of dark blood—the person is comatose; death is there if relief be not instantaneous. If *incomplete*, the spinal and sympathetic centres may still be functioning well, and, now that the inhibitory or restraining influence of the brain is withdrawn, their automatic functions may be performed with increased vigor. My view, then, is the first, above propounded. The sleep state is one that normally follows that fatigue which is the expression of waste unbalanced by repair.

There is diminution of cerebral molecular energy, owing to diminution of force-giving, intra-cellular material. All the cerebral functions are languidly performed. The heart and lungs participate with lessened genesis of force. The lingering blood current contains, relatively, an excess of carbonic acid, which adds to the depression by hindering waste. Just now (to speak metaphorically), the sympathetic feels a withdrawal of the restraint which, during the working hours, the cerebrum was exercising. *It is an instance of the rhythm of the functions.* Like a new actor in the drama, it steps upon the stage. By its spontaneous motor activity, it so controls the cerebral circulation that the tired brain has a season of rest.

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Hairy Men.—*The British Medical Journal*, Sept. 27, 1873, contains the following article on this subject:—

The anthropological interest attaching to *homines hirsuti*, always very considerable, has much increased since the observations of Darwin. Two remarkable examples—Russians, father and son—have lately arrived in Berlin and have been the subject of a lecture by Professor Virchow, of which we find an abstract in the *Edinburgh Medical Journal*. They are peculiarly remarkable in being edentalous. They are not hairy men in the ordinary acceptation of the term, but more resemble some of the monkey-tribe (the Diana monkey, Cuxio, &c.); while their edentalous condition carries them yet lower in the animal scale. The eldest is a man, aged over fifty-five, Andrian by name, said to be the son of a Russian soldier from the district of Kostroma. He was born during the service of his reputed father, and has no resemblance to him, to his mother, or to a brother and sister whom he possesses. To escape the unkindness of his fellow-villagers, Andrian fled to the woods, where he lived in a cave and was much given to

drunkenness; even yet, he is said to live chiefly on *sauerkraut* and *schnapps*, but his mental condition, which is truly none of the sharpest, does not seem to have suffered, and he is, on the whole, of a kindly disposition and affectionate to his son and those about him. Andrian was married, and had two children, who died young; one of these was a girl resembling her father; but of the other, a boy, nothing can be ascertained. Fedor, the boy exhibited with him, is three years old, and comes from the same village; he is said to be Andrian's son, born in concubinage; and it is most probable that this is the case, as it would be singular were two such creatures to originate independently in one small village. The peculiarity of these individuals is, that they have an excessive growth of hair upon one particular part of the body, namely, the face and neck; on the body and lower extremities there is also a stronger growth of hair, and particularly on the back and arms of the child there are sundry patches of .15 to .24 inch in diameter, covered with soft yellowish white hair, .12 to .24 inch long. Andrian has on his body isolated patches strewn, but not thickly, with hair  $1\frac{1}{2}$  to 2 inches long. But all this is trifling and subordinate compared with the hair-growth on the face, to which attention is mainly directed. Andrian has only the left eye-tooth in the upper jaw; Virchow has not stated how many teeth are in his lower jaw, but from the context it is improbable that he has more than his son, viz., four incisors. The son has no teeth in the upper jaw, hardly any alveolar process, and the upper lip is very narrow, so that the upper jaw appears depressed; the father presents the same appearance.

It is somewhat singular that a similar family has long been known to exist at Ava, and was first described by Crawford in 1829, and since then by Beigel. Three generations of this family are now known to exist. The grandfather, Shwe-Maon, had a daughter, Maphoon, and she again a son; all of whom present precisely the same peculiarities as in the family of Andrian, not only as to the growth of hair, but also as to the teeth. The grandfather has in the upper jaw only four incisors, in the lower jaw four incisors and one eye-tooth, and these teeth did not appear till he was twenty years of age. Maphoon has only four incisors in each jaw; the eye-teeth and molars are wholly wanting; the first two incisors appeared during her second year. The peculiarity of the hairiness in these individuals is of the same type as in Andrian and his son, in whom every part of the face and neck, usually only covered with lanugo, is covered with long hair, the very eyelids being so covered, the eyelashes being normal, while flowing locks come out of both nostrils, and also out of the meatus auditorius externus. At first sight, the occurrence of two such families in two such distinct parts of the world seems to point them out as "missing links,"—as the unreformed descendants of an earlier race of man. And our thoughts are carried back to the Ainos or hairy Kuriles, who are believed to be the remains of the aborigines of Japan, and who now inhabit the northern parts of the island of Jesso, and the southern part of the island of Saghalien. At first these aborigines were stated to be as hairy as our wild men, but from more accurate information obtained by the Berlin Anthropological Society, through the German resident, Herr Von Brandt, accompanied by numerous photographs and Japanese pictures of these Ainos, and from an examination of a skull recently obtained through Privy

Councillor Von Pelican, Virchow is able to state with positiveness that, neither in respect of the formation of hair nor in regard to the teeth, have the Ainos any analogy with the Russian or Burmese hairy men. The Ainos are certainly hairier on the chest and extremities than the nations around them, but there is nothing peculiar in the distribution of the hair, and the males have hair only on the typical parts peculiar to man. There is not a shadow of a race-connection between the Ainos and the Russian hairy men, and only the most prurient imagination could connect the latter with the Burmese family. No doubt, careful breeding could raise a new race of men from this accidental variety, just as various new races of domestic animals, dogs, for instance, have been propagated from accidental varieties. Virchow, however, believes that the peculiarities belonging to the Russian as well as to the Burmese families depend upon peculiarities of innervation which spring from accidental congenital abnormalities in the trigeminus, within whose domain all these peculiarities present themselves, only to be ascertained by careful dissection.

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A CASE OF RHEUMATIC FEVER TREATED WITH A COLD BATH; DEATH OCCURRING IMMEDIATELY ON LEAVING THE BATH. By SYDNEY RINGER, M.D.—These short notes are published, as this case will help to answer the following questions:—Can cold baths be administered in rheumatic fever without danger? and is it advisable, before employing this treatment, to wait for the onset of hyperpyrexia? or should we commence it when high fever, absence of joint-pain, suppression of perspiration, and delirium show that there is danger that hyperpyrexia may occur? As, hitherto, all cases of rheumatic hyperpyrexia have proved fatal unless treated by cold baths, it is obvious that this case in no way contra-indicates that treatment on the occurrence of this dangerous condition.

A young woman, aged 24, was admitted into University College Hospital with rheumatic fever. Her father died suddenly from some unknown cause. Four years before, the patient suffered from a severe attack of rheumatic fever. Her present illness began about a week before her admission into hospital. On her admission, she suffered from a sharp attack of rheumatic fever, her temperature rising daily to  $103^{\circ}$ . There was not, however, much joint-affection, and at first she perspired freely, but latterly her skin grew dry. She rapidly got worse: thus, during the nine days she was in hospital, her temperature rose daily till it reached  $105^{\circ}$ , and her respirations rose from 32 to 70; her pulse remained about 120 per minute, and throughout was strong. Latterly, she suffered from dyspnoea, and, consequently, was propped up in bed with pillows. She wandered a little at night, and on the day the bath was employed her intellect was a little obscured, and she passed her urine under her. At 7.42 of the ninth day of her admission, she was placed in a general bath of  $92^{\circ}$ , her temperature in the axilla being  $105^{\circ}$  Fahr. In seven minutes, and before the temperature of the bath was reduced, her rectal temperature was  $105^{\circ}.8$ ; the temperature of the bath was then reduced. In eighteen minutes after the commencement of the bath, her rectal temperature was  $105^{\circ}.4$ . After forty-four minutes, her temperature had fallen to  $103^{\circ}.4$ , the temperature of the bath being  $69^{\circ}$ . Whilst in the bath, she took four

ounces of brandy. She was removed because her breathing grew rather shallow. After being put to bed, she merely gasped a few times for five minutes and died, notwithstanding the employment of artificial respiration, energetic friction to the surface of the body, and anal injections of brandy. At the *post-mortem* examination, we found a few patches of recent lymph on both lungs, but not an unnatural quantity of serosity in the pleurae. The heart was universally adherent to the pericardium, the adhesions being tough; the blood in the heart and great vessels was very dark-colored, fluid and free from clots. The left ventricle and auricle were dilated—especially the auricle. On the tricuspid, mitral and aortic valves, numerous minute vegetations were seen at the usual places. The mitral, aortic and pulmonary valves were a good deal thickened. The mitral valves admitted three fingers nearly to the knuckles; the two segments were united for a short distance; they permitted some regurgitation when tested at the tap. The heart's substance looked healthy, and was of fair consistence. On the surface, at places, there was a thin line of paler and rather opaque tissue. The walls of the left ventricle, at the base, were half an inch thick, at the middle five eighths of an inch, and at the apex rather less than one fourth of an inch. The brain, liver, spleen, kidneys, stomach and intestines were healthy. During life, her urine contained a trace of albumen.—*London Practitioner.*

**Poisoning by Local Contact of Iodide of Mercury.**—Dr. A. W. Foot gives an interesting case in his "Select Clinical Reports," showing the effects that may be produced by the local contact of mercury. A herdsman, aged 23, was admitted into the hospital with loss of motion and sensation in the right hand and forearm. A little more than three weeks before admission, he had rubbed a quantity of red mercurial ointment, as cattle blister, into three head of cattle who were affected with pleuro-pneumonia. He had been in the habit of rubbing this ointment into cattle all winter, but, on this particular occasion, the usual precautions, with regard to covering and washing the hand, had been neglected. The paralytic symptoms were first noticed on the following morning.—*Dublin Journal of Medical Science.*

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## The Hospitals.

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### BOSTON CITY HOSPITAL.

THE surgical operations last Friday, January 16th, were as follows:—

Dr. Thorndike had a case of Abscess of the Thigh, which presented some interesting features. The patient was a man, fifty years old. Three months ago, while he was walking behind a two-wheeled cart, the body of the cart suddenly tipped up, and its edge came forcibly against the man's right thigh. The next day, the thigh was very greatly swollen. By rest and the use of fomentations, this distention subsided, and the patient was discharged, with the limb of the normal size. Presently, however, as the result of over-exertion, the swelling returned, and the thigh assumed its present proportions. There was a uniform enlargement of the whole thigh on its outer side, extending from the anterior superior spinous process to the patella. At the middle of the thigh, the circumference was four inches larger than the corresponding part of the other limb. The swelling was fluctuating, and was limited throughout its whole circumference by a firm wall of lymph.

Dr. Thorndike said the most interesting question in the case was concerning the diagnosis, as between a diffused traumatic aneurism and a simple abscess. If the former were the lesion, it would appear that the vessel injured had, after bleeding for a time, become plugged by a clot, and the products of the effused blood had become absorbed at the time of the first convalescence; then, premature exercise of the part unsealed the vessel again, and a new effusion had taken place. On the other hand, the whole trouble might consist of an abscess, the result of a degeneration of the extravasated material.

In either case, the treatment was plain—to give exit to the contained matter, and, if a bleeding vessel was at the bottom of the cyst, to secure it.

The sac, on being opened, was found to contain about two quarts of thin pus, with some shreds of sloughing fascia. Counter-openings were made, and silk setons were passed to connect them.

Dr. Cheever Amputated three Toes, in the case of a man who, a week previously, had performed partial amputation of the parts with an axe.

Dr. Cheever presented a case of Suppurating Bubo, the result of injury, in a child five years old. When the case was first seen, a week ago, the question was a doubtful one between a hernia and a lymphatic inflammation. An examination, under ether, showed that the swelling was upon, and not above or below, Poupart's ligament, and time had fully removed the doubt and had developed a small abscess, which was now incised.

On Tuesday, January 13th, Dr. Cheever operated upon a Cyst of the Neck, the patient being a young woman. The cyst had existed several months. The tumor extended from the lobe of the ear, behind and below the angle of the jaw. Dr. Cheever designed to dissect it out, with as little injury to the branches of the facial nerve as possible. For this purpose, a careful dissection was made, and some portions of the *pes anserinus* drawn upwards by a retractor. It was, however, found that the cyst lay beneath the parotid gland, and dipped in deeply, behind the angle of the jaw, to the bottom of the submaxillary triangle. A very troublesome arterial hemorrhage, from the bottom of the wound, followed immediately on severing the connections of the cyst. Some vessels were tied, and the bleeding was finally controlled by tamping the wound with a compress dipped in ferric alum, in which six small sponges were successively packed. The contents of the sac had a suspicious appearance of malignancy.

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## Correspondence.

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### ON SCARLATINA.

DOWN EAST, Dec. 1st, 1873.

MESSRS. EDITORS,—“What’s good for the scarly-teen-er?” That is one of the questions we country folks have to meet. “Why nothing, if I can get along without.” “But aint yer ‘fraid it’ll turn inter scarlet fever?” That’s another of the questions. Well, I don’t know how it is with you city folks, but down here the fellows, who call themselves homeopaths, have in their ignorance given the idea to the ignorant about them, that “scarly-teen-er,” as they call it, is a name for a mild form of scarlet fever. It was bad enough before, when some child would be sick, and have the canker rash and the throat distemper, and the scarlet fever, one after another, and all at once combined. But to have the “scarly-teen-er” stuck on in advance by Dr. Likecureslike is a little too much. Four diseases! Isn’t it a wonder that any of them get well?

We’ve got that Dr. L. in a neighboring village, and he travels about with his medicine case, and, by the help of the sugar-coated morphine pills, does considerable execution. Why shouldn’t he? He’s got a degree. A friend of mine saw it in his office. He used to sweep out store and handle the pestle for an apothecary in a country town, in a neighboring State. He came across the circular of that Philadelphia University, sent fifty dollars to the Dean and Doctor of Medicine! I don’t know why it is, but in some places Down

East, men who would despise the name of homœopath will meet such jackasses as this fellow. They haven't courage to say "no;" and they wonder I won't bow to the man when I meet him. But this is no answer to the question put to me—"What's good for the scarly-teen-er?"

In an old number of your JOURNAL—I haven't time to turn to it, but it must be twenty-five years old—I learned how to treat the disease. Dr. Ephraim Buck, of your city, I think it was, told one of your Societies that he always greased his patients, who had scarlet fever; that it reduced the temperature, and quieted the patients, so that they fell asleep. He took off the rind from a piece of pork fat, big enough to cover the whole inside of his hand, and with that he rubbed the patient all over from head to foot, as often as he grew restless. Generally, the patient got away without any medicine. Well, I thought I would try it. Pork suits me outside much better than it does inside. So it does other folks. It occurred to me that all the greasing does is to keep the skin from burning up, and it will be as well if any other oily matter is used. So I used, afterwards, what they call "sweet oil." It smells rather better than pork fat. It's astonishing how much the skin will take up, and how much more quiet the patient gets. It's just as good in measles and in typhoid fever, and in any febrile attack that I have seen. It quiets the patient.

After I began this, I read an article in your paper for November 13th, on Scarlatina. Now, Dr. Baker didn't live a thousand miles from my town, when his field of practice was in those three towns in Cumberland County. I cannot help thinking that he must have done an awful big business to have 247 cases of scarlatina in four months, "most of which were of a very malignant type." Over two new malignant cases a day, and only "five were fatal, or a fraction over two per cent." Why, that was a twelfth of all the children under fifteen years that lived in those three towns. I don't think we should agree in our description of malignant scarlatina, any more than we should in our treatment.

Yours, RUSTICUS.

#### AN APPEAL.

53 WEST 33D ST., NEW YORK, Dec. 30, 1873.

MESSRS. EDITORS.—Will you have the kindness to insert the enclosed circular in your valuable JOURNAL, and forward to the Committee therein named the contributions that your readers may be pleased to make to the noble object set forth? Very respectfully yours,

NATHAN BOZEMAN, M.D.

*To the Medical Profession at large.*

In obedience to the resolution of the Convention of Physicians, lately assembled in this city, we undertake this address to your sympathy, with full assurance that its hallowed object will secure your cordial support.

But yesterday our community was as a house of mourning, and its wail of distress, arising from stricken hearts and desolate homes, smote the ear of the world with the horrors of our affliction. Those of our people who remained in the doomed city can alone appreciate the sad story of suffering seen and felt in our midst, when death thus held, for seven long weeks, its high carnival among us. Over the entire city death and silence brooded. Its deserted streets, alike both day and night, scarce echoed a sound save the mournful hearse-rattle as it hurried to the grave its load of dead, or the footfalls of those ministers of mercy who lighted up the hours of darkness with their visits of charity. Silently and continuously the pious labor of love was performed, and each rivalled the other in the patient discharge of a common humanity. When the shaft of death prostrated one, another, with true Corsican spirit, took his place, and the work of benevolence went fearlessly on, until, under the favor of Heaven, the disease was baffled and the reign of terror at an end. Each creed, sect, order and brotherhood had its heroes and its martyrs, and it is in commemoration of the deeds of both the living and the dead that our hearts should never suffer forgetfulness.

The faithful physician who survived the storm bears in his conscience its

plaudits of duty done; but our seven brothers, Williams, Freeman, Crone, Hatch, Kennon, Blount and Minor, fallen at their post, martyrs to the cause of humanity, aye, bright exemplars of professional honor and duty, sleep in their quiet graves, with more lasting glory than embalmed warriors in piles of storied marble. Our fallen brothers, if they could be consulted, would doubtless wish no fitter burial than quiet interment in leafy Elmwood, but professional pride demands the honor of their perpetual commemoration, and we ask in this behalf that suitable stones be raised and carved for them. Their fame, the story of their heroism, belongs to the medical world, and our brethren throughout the broad land are respectfully requested to contribute something to this laudable end. Your contributions, however small, will aggregate a success of the enterprise.

Remittances may be made to either member of the Committee.

RICHARD H. TAYLOR, M.D., 44 North Court St.  
F. L. SIM, M.D., 1154 Beale St.  
R. W. MITCHELL, M.D., 275 Main St.

*Memphis, Tenn., Nov. 10, 1873.*

#### EFFECT OF CHLOROFORM ON THE PUPIL.

BOSTON, Dec. 27, 1873.

MESSRS. EDITORS.—The very interesting communication of Dr. Blodgett on the effect of ether on the heart's action, in the case of a patient of the Infirmary, reminds me of a case of congenital cataract on which I operated, many years ago, at the Infirmary, which was at that time in Bowdoin Square. It was soon after the introduction of chloroform, which was then held to be equally safe with ether. From some idiosyncrasy in the infant, the pupils dilated but imperfectly under the application of atropine. As I was about to perform the usual anterior operation of division of the soft cataract, this was an embarrassing incident. To my great surprise and satisfaction, the instant the child came under the effect of the chloroform, the pupils fully dilated, and the operation was finished without the slightest difficulty.

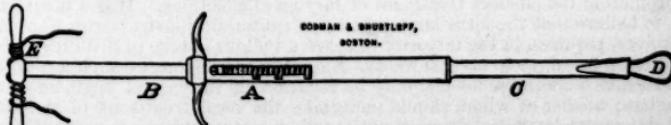
G. A. BETHUNE.

#### A NEW SPRING LIGATOR.

LYNN, Jan. 1st, 1874.

MESSRS. EDITORS.—This instrument, to which I desire to call the attention of the profession, is the invention of Dr. L. J. Crooker, of Augusta, Me. The original instrument, made by him, I saw while on vacation last summer, and was sufficiently interested in it to ask permission to take it to Boston and bring it to the notice of Codman & Shurtleff. It was at once appreciated by them, and they will engage in its manufacture, under the name of Crooker's spring ligator.

The instrument is designed for the removal of anything for which gradual is preferred to rapid removal, and its *modus operandi* will be readily understood from the accompanying cut.



A is a tube containing a spiral spring. B is a smaller tube, sliding within A. C is nearly solid, having a perforation only large enough for the passage of the wire ligature, D. By pushing in the tube, B, the spring is compressed, and is held so by engaging a screw attached to B, in one of the notches seen on the slot in A. The ligature can then be applied, tightened and fastened at E. The spring then being released, the action is obvious to any one.

This is presented as a much more convenient and inexpensive instrument than the spring ligator already before the profession, described by Dr. Greene, of Portland, in a former number of this JOURNAL, and it will be found equally efficient. The piece C can be made straight, or of any curve desired, and it would be well to have several pieces, of different form, with each instrument. By unscrewing the piece C, removing the spring and shutting B within A, we have three pieces that can easily be carried in the pocket or be put in a small case.

J. O. WEBSTER, M.D.

#### SICKNESS RATES.

BOSTON, Jan. 9, 1874.

MESSRS. EDITORS.—The communication of Dr. Derby, in your yesterday's issue, leads me to ask for a little space in your JOURNAL, to invite the attention of readers, and especially of Dr. Derby himself, to a proposal which appeared in a recent number of the *Lancet*, by a retired army surgeon, for obtaining a knowledge of the sickness-rates of the pupils attending the public schools.

His plan is, in substance, to have a regular weekly or monthly report, made by teachers to the school board, of the number of registered scholars absent from school by reason of temporary sickness, and, by truant officers, of the number of children of school-going age who have diseases which prevent them from attending school at all. He proposes to have the name of the disease ascertained from the parents in each class of cases, and constitute a feature of the report.

The *Lancet*, in an editorial note, comments favorably upon the scheme; but thinks that, to secure the best results, there should be a medical officer whose duty it should be, when called upon, to visit homes for the purpose of correcting or confirming a doubtful diagnosis.

Would not some such method as this, carefully adjusted to our school system, be at once practicable and useful? It would be especially applicable to cities; and thus, in respect to the youthful part of the population, at least, would remove the difficulty recognized by Dr. Derby of obtaining reports of sickness-rates in the large communities.

Will Dr. Derby kindly give his opinion on this matter through your pages? Perhaps a definite plan, emanating from him, would receive the coöperation of school committees, and produce information of great value.

J. S. GREENE.

#### LOCAL ANÆSTHESIA OF THE LARYNX.

PHILADELPHIA, Jan. 5, 1874.

MESSRS. EDITORS.—I fear that an article in a late number (No. 26, Vol. LXXXIX. Dec. 25, 1873) of the Boston Medical and Surgical Journal, with the above title, will promulgate an erroneous impression of a very reprehensible practice, which has had fatal sequences in Vienna. It places the patient in unnecessary peril. A safe local anæsthetic for the larynx will be a great desideratum; and the man who discovers it will rank only second to Czermak in promoting the efficient treatment of laryngeal affections. It is a mistake, too, to believe that the intra-laryngeal use of cauterizing instruments, or even of knives, requires, in the majority of cases, a tedious course of drillings lasting from a few days to several weeks. Except in rare instances, such a course of tentative manipulations can only be required in the case of beginners or bunglers; neither of whom should undertake the local treatment of serious and dangerous laryngeal diseases until preliminary experience in cases of less moment has rendered their fingers steady, and familiarized them with the utilization of various physiological muscular motions which facilitate their manipulations. I am certain that Boston contains a number of men with sufficient manual skill to treat promptly and effectually any intra-laryngeal complaint requiring local interference, without an extensive course of these preliminary drillings, and without resort to a local anæsthetic.

I am, yours truly,

J. SOLIS COHEN, M.D.

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## Medical Miscellany.

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DR. WM. WARREN GREENE, of Portland, has resigned the chair of surgery at Long Island College Hospital. We are happy to hear that he has recovered from his severe illness and has resumed practice.

DR. HENRY W. FULLER has recently died in London, at the age of 53. He will be best remembered in medicine for his inquiry into the use of alkalies in rheumatism, and he was an ardent advocate for their employment in sufficiently large doses in this disease.

FOR THE CHAFING OF INFANTS.—Take of powdered starch two parts, white oxide of zinc one part. Make a fine, well-mixed powder. Dust the abraded parts with the powder, after proper cleansing.—*Exchange.*

"THE noisy and pretentious form of medical superstition which was introduced by Hahnemann is passing to decay through the customary intermediate stage of a dying delusion—the stage of fraud."—*British Medical Journal.*

CHOLERA IN HUNGARY.—The *Lancet* states that the epidemic of cholera in Hungary, from its beginning in 1872 to its close in 1873, is said to have attacked not less than 433,000 persons, and of these killed upwards of 183,000.

ARTIFICIAL ELONGATION OF THE CLITORIS.—Among some of the negro tribes of Western Africa the strange fashion exists of artificially elongating the clitoris by means of small weights appended to it, and the organ is thus gradually increased in size until it becomes lengthened several inches. This result is considered ornamental.

ADULTERATED MILK.—A milkman was recently fined £15 in Dublin for selling as milk a mixture of 90 per cent. of water and 10 per cent. of milk; the magistrate explaining that he had not imposed the full penalty of £20, because he wished to leave a margin of £5 to meet the case of any enterprising trader who might carry adulteration to a yet further pitch.

THE ISLAND OF MAURITIUS has of late years gained an unenviable notoriety for its insalubrity. A few years since, malarious fever and dysentery committed fearful ravages there. Recent accounts state that a severe epidemic of measles has appeared in the colony. At Port Louis, the death-rate during the month of November was 92 per 1000.

FORMULA FOR INTERTRIGO.—M. Legal recommends the use of subnitrate of bismuth in eruptions caused by scratching, induced in turn by the itching of intertrigo. Glycerine is employed as an excipient, because it does not become rancid, and the tincture of cochineal to give a color. Rx. Subnitrate of bismuth, glycerine, of each eight grammes; tincture of cochineal, twenty drops.

REMEDY FOR CHRONIC HOARSENESS.—In chronic hoarseness arising from thickening of the vocal cords and adjacent membrane, the ammoniated tincture of guiacum is often a very efficacious remedy. It may be appropriately mixed with equal parts of the syrup of senega, and a teaspoonful of the mixture given two or three times a day.—*American Practitioner.*

TOBACCO-POISONING.—A fatal case of poisoning by tobacco is reported in the Naval Medical Report just issued. It occurred in the person of a boy of the *Implacable*. He had been frequently punished for chewing tobacco, and had often presented himself at the sick bay complaining of debility, giddiness and faintness, which were traced to the poisonous influence of tobacco. On two occasions, he had swallowed pieces of tobacco to prevent detection. On the night of his death, he went to his hammock, telling his messmates that he felt sick. About ten minutes afterwards, the occupant of the next

hammock to his heard him breathing stertorously, and immediately tried to awaken him. Finding he could not, he was conveyed to the sick bay, and at once seen by a medical officer, who found him moribund. The pupils were insensible to the influence of light; and the pulse, which was scarcely perceptible, in three minutes ceased to beat. On *post-mortem* examination of the body, two small pieces of tobacco were found in the stomach.—*British Medical Journal*.

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#### NOTES AND QUERIES.

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In the *Boston Business Directory* for this year, published by Sampson, Davenport & Co., among the names of physicians in Brighton, Charlestown and West Roxbury, I find several with —(Allo.)—against them. Several of these names are of men respected by the profession, and never suspected of any kind of quackery. What does the affix mean? Was it given to the publishers of the *Directory* by the persons named? \*

MESSRS. EDITORS.—It doesn't add to the peace of mind of an humble follower of medical science to find that an urinometer, in which implicit faith and confidence had been placed for over six years, is utterly worthless. It is with much vexation of spirit that I recall the careful observations that have been made in this time, which I last week discovered were to no purpose, for, on casually dropping my urinometer into a glass of water, it sank far below the "W" mark, and, in fact, almost out of sight.

It was bought of a well-known instrument dealer in New York, and is like those ordinarily used hereabouts. Now I have one of Heller's, but, as I never saw one in my student days, it is new and strange to me, and I confess I don't know how to use it. Will you kindly enlighten me, for none of my books throws any light on this subject? P.

MESSRS. EDITORS.—I have several times had occasion to prescribe phosphorus, and have written for Warner's pills, one fiftieth of a grain each. At least three apothecaries have given, instead of Warner's, (one fiftieth of a grain), Bullock & Crenshaw's, (one sixtieth of a grain). As there is a great difference between the pills manufactured by these parties, there need be no such mistake, and it could only have been intentional on the part of the apothecaries, who probably did not have Warner's.

Bullock & Crenshaw's pill is about three sixteenths of an inch in diameter, made up with a dark, brownish-colored bitter mass, with either no odor or taste of phosphorus, or with only a very faint taste of it. In some, which were carefully analyzed, no phosphorus was found. Warner's pill is over one quarter of an inch in diameter, is made up from a whitish mass, with a very decided, unmistakable odor of phosphorus; indeed, his pills containing one one-hundredth of a grain smell more strongly of the agent than those of one sixtieth of a grain manufactured by the other party. Apothecaries, please send our patients the medicine ordered, in justice to our patients and to us! Physicians, examine the medicines procured by your patients, and, if not correct, have the error corrected! PILLS.

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**ERRATUM.**—The residence of Dr. W. R. Dunham is in Westmoreland, N. H., not in Vermont, as stated in our issue of the 8th.

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**MORTALITY IN MASSACHUSETTS.**—*Deaths in sixteen Cities and Towns for the week ending January 10, 1874.*

Boston, 139—Worcester, 17—Lowell, 24—Milford, 4—Chelsea, 5—Cambridge, 20—Salem, 10—Lawrence, 13—Springfield, 12—Lynn, 11—Fitchburg, 2—Newburyport, 4—Somerville, 3—Fall River, 18—Haverhill, 5—Holyoke, 4. Total, 291.

**Prevalent Diseases.**—Consumption, 49—pneumonia, 42—scarlet fever, 24—typhoid fever, 15.

GEORGE DERBY, M.D.,  
Secretary of the State Board of Health.

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**DEATHS IN BOSTON** for the week ending Saturday, Jan. 17th, 133. Males, 73; females, 60. Accident, 4—apoplexy, 3—asthma, 1—inflammation of the bowels, 2—disease of the bowels, 1—bronchitis, 5—inflammation of the brain, 1—congestion of the brain, 1—disease of the brain, 3—cancer, 3—cerebro-spinal meningitis, 2—consumption, 19—convulsions, 1—croup, 1—debility, 5—diarrhoea, 1—drophy of the brain, 6—diphtheria, 1—scarlet fever, 10—typhoid fever, 2—disease of the heart, 12—hernia, 1—intemperance, 1—disease of the kidneys, 2—disease of the liver, 2—congestion of the lungs, 1—infestation of the lungs, 19—laryngitis, 1—marasmus, 6—measles, 1—old age, 1—paralysis, 3—premature birth, 3—pyæmia, 2—puerperal disease, 2—scrofula, 1—tabes mesenterica, 1—tumor, 1—whooping cough, 1.

Under 5 years of age, 49—between 5 and 20 years, 9—between 20 and 40 years, 29—between 40 and 60 years, 24—over 60 years, 22. Born in the United States, 92—Ireland, 29—other places, 12.